MEMORANDUM

SUBJECT: Gulfco Updated Screening Ecological Risk Assessment

FROM: Susan Roddy

TO: Gary Miller

DATE: June 19, 2009

I have reviewed the Updated Screening Ecological Risk Assessment for Gulfco, and have the following comments:

1. This screening level ecological risk assessment (SLERA) document goes beyond that of a screening ecological risk assessment somewhat into that of a baseline ecological risk assessment (BERA) (i.e., using LOAELs and ERMs), although there were no site-specific tissue samples collected for use in the food chain calculations nor was site-specific toxicity testing data collected as is commonly done for a BERA and as had been previously requested by EPA based on the original screening ecological risk assessment. This SLERA needs to be more clearly distinct from a BERA to enable a more transparent and justifiable decision as to whether to proceed to a BERA. The decision made at the end of this updated SLERA document to not do any further investigation for a baseline ecological risk assessment (such as collection of tissue and toxicity testing data) is not clearly supported for the following reasons: a) There is concern that LOAELs and ERMs (which are to be for use in BERAs, not SLERAs) were used as decision points in this SLERA instead of (more appropriately) in a BERA following site-specific tissue data collection and toxicity testing. Rather, the risk management recommendations for remedial decision-making to be made after a BERA usually begin with a bracketed range between NOAEL-based and LOAEL-based backcalculated media concentrations within which preliminary remedial goals are selected. b) There were some contaminants identified as bioaccumulative in Section 2.6 that were not but should have been included in Table 21 listing the contaminants carried forward for further evaluation in this updated SLERA (which included desktop literature-based food chain evaluations, not based on site-specific tissue data); thus, it is unclear whether hazard quotient exceedances might have occurred in this SLERA that would warrant further investigation to include site-specific tissue data collection for a BERA. c) There were contaminants exceeding the point of departure, the hazard quotient exceeding unity, (i.e., dibenza (a,h) anthracene using the available individual eocotoxicity value for this PAH), and it is unclear if there would have been others given differences in Section 2.6 and Table 21. d) For the protection of benthos, it is not justified that 95% UCL-based contaminant concentrations using 15 acres is adequately protective of local benthic community receptors (which are more sedentary and don't have a home range size of 15 acres) which is why maximum site concentrations are more appropriate for benthic receptors. (The use of 95% UCLs are more acceptable for other nonsedentary receptors.) Toxicity testing data as a further investigation to

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evaluate protection of the benthic community for a BERA is warranted. Another line of support for site-specific toxicity testing data for a BERA is illustrated by the use of the ERM-quotient methodology indicating benthic toxicity as referred to in the TCEQ/trustee comment letter. e) An issue of concern is that there are contaminants exceeding ecotoxicity screening values as well as contaminants identified as bioaccumulative in Section 2.6 that were to be carried forward for further evaluation that are not listed in Table 21 (COPECS Identified in Step 1 and Quantitatively Evaluated in Step 2).

2. Another issue is that (statistical) background comparisons were used in this SLERA to eliminate contaminants from further evaluation when ecotoxicity screening values were already exceeded by site media concentrations (which is an issue due to EPA national policy and guidance on background). Due to EPA national policy and guidance on background, regardless of whether contaminants detected at the site are less than background concentrations, risk is to be characterized for contaminants exceeding ecotoxicity screening values, and determination regarding cleanup decisions for these contaminants is to occur at the end of transparent characterization in the baseline risk assessment. In this updated SLERA document, contaminants (that had site media concentrations already exceeding screening ecotoxicity values) were eliminated prematurely from further evaluation based on background comparisons. And, since this SLERA document included desktop literature-based food chain estimations (not using site-specific tissue data), these contaminants (eliminated based on background comparisons) appear inappropriately not to be included in the desktop food chain evaluations in the appendices. (And, even given the background comparisons that were done, if appropriately done at the end of a BERA, there are questions about the consistency of Table 20's asterisked notations for some of the contaminants with those in Appendix B, such as for cadmium for North Soil being listed as a Yes* instead of as a Yes, regarding whether site concentrations were statistically significantly greater or less than the background concentrations.) For EPA Region 6 Superfund site ecological risk assessment (in compliance with EPA's national policy and guidance on background), it is required that, in moving from a SLERA to a BERA, contaminants not be eliminated based on being less than background concentrations if the contaminants' screening hazard quotients exceed unity. In general, while BERA toxicity testing and tissue data collection may or may not be required for these contaminants, the contaminants are not allowed to be eliminated. Rather, at the very least, in the Uncertainty Section of the BERA's Risk Characterization, the Region requires that statements be made for those contaminants (for which the site media concentrations exceed screening ecotoxicity values yet are less than background concentrations) that there could be potential risk contributed from these background contaminants. Thus, the contaminants get transparently carried through to the end of the BERA as required by EPA national policy and guidance on background. Information on background contaminants, concentrations, and background risk is to be used at the end of the BERA to assist risk management/remedial decision-making; thus, it is inappropriate to eliminate contaminants based on background comparisons in Step 2 of a SLERA.

3. Average Exposure Point Concentrations (EPCs) should not be used as a point of departure for ecological risk assessments in hazard quotients calculations trumping the use of 95% UCL Reasonable Maximum Exposure high end values as EPCs (the 95% UCL RME is to be the point of departure, not the average). Thus, text (especially results and conclusions), Tables (especially Tables 18, 24, 25, and 26), and Appendices for hazard quotient calculations need revision to thoroughly emphasize this since discussions of remaining COPECs seemingly were pared down in the latter part of the conclusions by mentioning average-based EPCs.

4. It is unclear why some of the receptor guilds mentioned did not have a representative species selected for evaluation (i.e., mammalian and avian herbivores).

5. More consistently, receptors evaluated for food chain analysis should be discussed in terms of guilds rather than focusing on the individual species evaluated to represent the guild. This is to serve as a reminder that it is the guild that is being protected, not just the species being evaluated to represent the guild.

6. Other than footnotes on tables about the conservatism used in selecting literature values for BAFs for PAHs, it is unclear on the tables as well as in the text if there was sufficient conservatism used in selecting literature-based BAFs and BSAFs for contaminants (other than the PAHs) evaluated in this SLERA document's desktop food chain calculations (which were literature-based instead of based on collecting and using site-specific tissue data for the food chain calculations). Clarity on the conservatism for the BAFs and BSAFs is needed.

7. It was unclear whether the values for ingestion (food and media) and body weight used in the desktop food chain evaluations were initially maximum values (for ingestion) and minimum values (for body weight), and then recalculations, as allowed by EPA, were run using average values for ingestion and body weight parameters. Also, there needs to be more clarity regarding the conservatism of the media ingestion values.

8. Another concern with these desktop literature-based screening food chain estimations is that for some receptors, there were assumptions made to include media ingestion but not food ingestion (such as the deer mouse), whereas, for others, food ingestion was included, but not media ingestion. Clarifications and/or revisions are needed in the text as well as in Table 18 including consistency between the text and Table 18).

9. It is unclear why Table 18 doesn't include plants as a receptor.

10. It is unclear on the top of page 25 what is meant by the use of dietary concentration rather than daily dose for second order carnivorous fish, mammals, and birds, and whether its use was appropriate.

11. Toxicity Reference Values (TRVs) should not be directly applied across classes of receptors as was done in the appendices for reptiles (i.e., bird and mammal TRVs were used to represent reptiles), and broccoli was used to represent earthworms. Where no TRVs were available for

some of the contaminants, qualitative statements should be made instead to describe potential risk by comparison to why risk estimates would be expected to similar to or different from those for other classes of receptors.

12. Discussion and mapping of any hotspots and concentration gradients would be helpful.

13. The Section (3.4.8) discussing obtaining LC 50 values for further evaluation for contaminants that had already exceeded surface water screening values in Section 2.6 is unclear and does not seem supported. The purpose for obtaining these LC 50 values is unclear, and it was not clearly stated in this Section that a LC 50 value is not an appropriate screening value and was not to be used without conversion factors to convert LC 50 values to LOAELs and NOAELs. And, in Table 27, LC 50 values (unmodified with conversion factors) are presented and appear to be used inappropriately. And, if the contaminants (for which LC 50 values were obtained) already had TX Water Quality Standards, the TX Water Quality Standards should be used in preference to the LC 50 values obtained. It seemed from the discussion that there was a search for studies of a 96 hour duration, studies using saltwater, and studies using species native to TX. Yet, in the description, there were exceptions made to these search criteria which generates more questions and uncertainty. Also, where there were multiple LC 50 values obtained for a contaminant, the justification for enough data points for calculation of a geometric mean was not adequately described as supported (such as that done in the protocols used for calculation for federal ambient water quality criteria, or as that done in the SOPs used for quality control in identifying adequacy of literature values used in calculation of geometric means for EPA's ESSLs). Thus, the section and conclusions on the use of these LC 50 values should be eliminated.

14. The decision described in Section 3.4.8 regarding bioaccumulative contaminants identified in surface water (from Section 2.6) was to conduct no additional quantitative evaluation because while detected, the 3 bioaccumulative contaminants (mercury, selenium, and thallium) were not measured above the screening criteria for surface water. This decision seems to contradict the logic of the decision made for other medium's contaminants that when bioaccumulative contaminants were detected, they were carried forward for the desktop literature-based food chain estimations done in this updated SLERA. It is unclearly supported as to why as is stated bioaccumulation would be accounted for in the surface water ecotoxicity screening values used.

15. In the Uncertainty Section, revisions are needed regarding any statements postulating overestimate of risk in light of comments made above.

16. On page 41, in the next-to-last bullet, the last sentence states that "no other LOAEL or ERM-based HQs for North Area wetlands sediment exceed 1 for the other ROPCs". However, the AET-based HQs for the RME EPC for benzo(g,h,i)perylene and indeno (1,2,3-cd)pyrene do exceed 1, for the benthic receptor, and that should be mentioned. And, in the last bullet, it is stated that "none of the ERM or LOAEL-based HQs in pond sediment is greater than 1". However, the sandpiper NOAEL-based HQ for the RME EPC for nickel exceeds 1, and that should be mentioned.